Yemen

Last Updated: February 2011

Background

Yemen is located along the Bab el-Mandab, a strategic world oil shipping route.

Yemen is important to the global oil trade because of its location on the Bab el-Mandab, one of the world's most strategic shipping lanes, through which an estimated 3.5 million barrels of oil passed daily in 2010. Disruption to shipping in the Bab el-Mandab could prevent tankers in the Persian Gulf and the Gulf of Aden from reaching the Suez Canal/Sumed pipeline complex, requiring a costly diversion around the southern tip of Africa to reach western markets.

In recent years, this region has seen rising piracy off the Somali coast in the Gulf of Aden and southern Red Sea, reaching further out into the Indian Ocean. Security concerns involving militant groups has also deterred investment in recent years, with numerous attacks to energy infrastructure slowing production and increasing costs. Tribal conflicts have also resulted in attacks on pipelines in the north of the country.

Yemen's economy is heavily dependent on hydrocarbons, which account for 30 percent of GDP, nearly 75 percent of government revenues, and over 90 percent of foreign exchange earnings. In certain cases, Yemen is seeking to increase foreign investment in its energy sector, as declining oil revenues are weakening the government's ability to provide basic services. Extensions of long-standing agreements with international oil companies (IOCs) have been blocked by parliament, decreasing incentives for large investments necessary to stem the decline in production rates. Earnings from its liquefied natural gas (LNG) exports are projected to provide a partial offset of Yemen's falling oil export revenues in 2011, when Yemen's LNG project reaches full capacity.

Oil

Yemen seeks to attract more foreign investment to boost exploration efforts and reverse its declining crude oil

According to *Oil and Gas Journal*, Yemen had proven crude oil reserves of 3 billion barrels as of January 1, 2011. Yemen's oil reserves and production are sourced from two geological areas: Marib-Jawf basin in the north, and Say'un-Masila basin in the south. Masila's Block 18 is estimated to hold the country's majority of reserves, approximately 84 percent of the total, according to Yemen's Petroleum Exploration and Production Authority. Yemen's oil reserves are

production. generally light and sweet (low in sulfur content), with API gravities ranging from 28 degrees to 48 degrees, with the highest quality crude coming from the Marib-Jawf Basin.

Sector Organization

Yemen's General Corporation for Oil, Gas and Mineral Resources, is a loose affiliation of several state-owned subsidiaries including: Yemen Oil Company (YOC), Yemen Refining Company (YRC), Petroleum Exploration and Production Authority (PEPA), Yemen Gas Company (YGC), Oil Products Distribution Company, General Department of Crude Oil Marketing (GDCOM), and Safer E&P Operations Company (SEPOC). General Corporation for Oil, Gas and Mineral Resources is responsible for managing industry contracts and relations with operators and partners, as well as the government's share of crude exports.

All branches report to the Ministry of Oil and Mineral Resources, which is responsible for oil policy. The oil sector is open to private company investment on a production-sharing basis with Yemen Oil Company (YOC). Contracts with foreign oil companies, however, require parliamentary approval, which has become an obstacle to concluding contract extensions. SEPOC, Yemen's leading national oil company, was formed in 2005 to take over Marib Block 18 when Hunt Oil and ExxonMobil's license expired and the parliament vetoed its extension. This type of political uncertainty has impeded the deployment of more costly enhanced oil recovery (EOR) methods that are deemed necessary to slow the high natural decline rates.

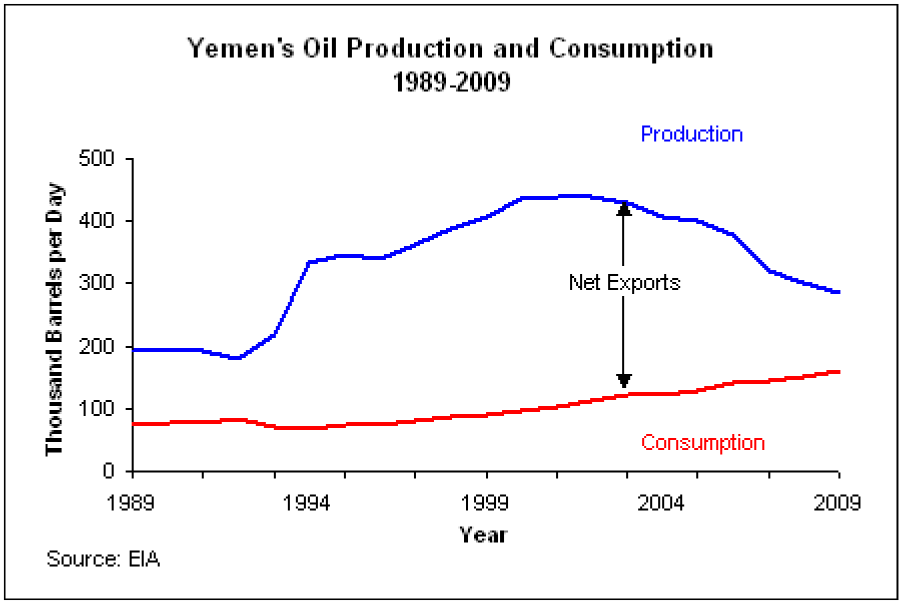
Recently, most of the interest expressed by IOCs has been for acreage that has been extracted from larger, older blocks that remain largely unexplored. The government has had little success in recent exploration development, with international investors losing interest in upstream bid rounds. After an unsuccessful bid round for offshore licenses in 2008, the government attempted to induce participation of majors such as Total, Shell and Exxon through direct negotiations. In October 2010, however, the government did open a bidding round for six onshore and four offshore blocks and received increased investor interest.

Production and Exploration

In 2010, Yemen's total oil production averaged about 260,000 barrels per day (bbl/d), down from 286,000 bbl/d estimated for 2009. Production has been declining steadily since reaching a peak of 440,000 bbl/d in 2001. EIA estimates oil output will decrease further to 250,000 bbl/d in 2011 and 2012.

There are twelve producing blocks, operated by nine international oil companies. Production at Norwegian DNO International’s Block 47 is set to begin during 2011, depending on the security situation in the country. Currently, thirty-one blocks are under exploration by international oil companies in partnership with Yemen Oil Company. Exploration saw relative success in 2010, with discoveries announced at several blocks. Recent exploration activity has focused on the area bordering Saudi Arabia, but additions from this region have been relatively small.

Despite interest from a large number of companies during an initial licensing round for offshore licenses in late 2007 and 2008, domestic security uncertainty and the escalation of piracy in the Gulf of Aden derailed exploration of Yemen's offshore areas. PEPA has stated publicly that its transition from open bidding rounds to direct negotiation in 2009 has been effective. The government awarded three additional blocks in 2010: Block 48 was awarded to DNO International, Block 85 to Total SA, and Block 86 to Austria’s OMV. In July 2010, Total also purchased a 36 percent stake in DNO’s Block 72. These blocks were dissected from larger blocks already in exploration or production. Negotiations are ongoing over other blocks, both onshore and offshore.



Consumption and Exports

Yemen had net exports of 105,000 bbl/d of oil and total domestic consumption of 156,000 bbl/d in 2010, according to preliminary estimates. With growing domestic consumption and decreasing production, net exports continue to decline. Yemen does import some refined products; in 2007, the most recent data available, imports of refined product were estimated at 63,000 bbl/d, mainly distillate and residual oils. Asian markets account for the majority of Yemen's oil exports.

Pipelines and Export Terminals

Yemen has a comprehensive 662-mile pipeline system serving its five export terminals, three of which handle crude exports. The 270-mile Marib-Ras Isa pipeline has a throughput capacity of 400,000 bbl/d and transports oil from the Marib basin to the Ras Isa offshore export terminal on the Red Sea, Yemen's main crude export point. Masila-Ash Shahir is a 90-mile pipeline running from Masila and East Al Hajr to the export terminal at Ash Shahir (also known as Al Mukallah) on the Gulf of Aden. The pipeline has a capacity of 300,000 bbl/d, while the Ash Shihr terminal has upwards of 3.5 million barrels of storage capacity. The 130-mile, 135,000 bbl/d Shabwa-Bir Ali pipeline runs from from the Shabwa region to the Bir Ali terminal on the Gulf of Aden. The ports of Aden and Hodeidah handle refined products exported onto smaller tankers.

Downstream

According to the January 2011 *Oil and Gas Journal*, Yemen has a total crude oil refining capacity of 140,000 bbl/d from two aging refineries: the 130,000 bbl/d Aden refinery built in 1954 and operated by Aden Refinery Company (ARC), and the 10,000 bbl/d Marib refinery built in 1986 and operated by the Yemen Refinery Company. In January 2011, it was reported that the Chinese and Yemeni governments were in discussions about a concessionary loan to finance the modernization of the Aden refinery. The refinery has a nameplate capacity of 130,000 bbl/d, however given its age the average current throughput volume is estimated at no more than 100,000 bbl/d. China's Ministry of Commerce said that Yemen is planning a US$1.5 billion renovation project.

Natural Gas

Yemen began exporting liquefied natural gas in November 2009. Increasing domestic consumption and reliance upon gas re-injection for oil production has created potential shortages in domestic supplies of

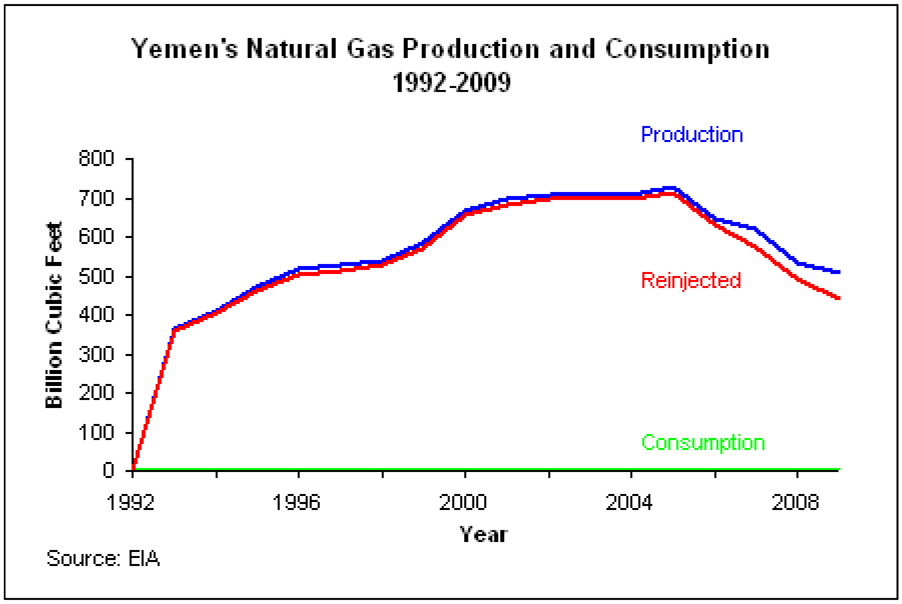
According to the *Oil and Gas Journal*, as of January 1, 2011, Yemen had 16.9 trillion cubic feet (Tcf) of proven natural gas reserves. Most of Yemen's natural gas reserves are associated gas concentrated in the Marib-Jawf fields, which contain 10 Tcf of proved reserves according to Yemen LNG. Success in developing the liquefied natural gas (LNG) sector is likely to increase interest in further natural gas exploration and production. The need for natural gas feedstocks has become a concern for oil producers in the country, as they lose significant volumes used for gas re-injection to LNG export obligations.

Exploration and Production

Yemen produced an estimated 509 billion cubic feet (Bcf) of gross natural gas in 2009, of which 441 Bcf was reinjected to provide enhanced oil recovery, 18 Bcf was vented and flared, and 50

natural gas. Bcf was marketed, of which about 15 Bcf were exported from the newly operational Yemen LNG project. Natural gas production began in Yemen in 1993, reached a peak of 727 Bcf in 2005, and then began to decline thereafter.

The Yemeni government's plans for increased domestic use of new natural gas reserves include the transition of power generation from diesel fuel oil to natural gas fuels. Some of the independent energy firms exploring for oil have found associated pockets of natural gas along with new oil discoveries. Reportedly, all new production sharing agreements (PSA) with foreign companies now include a clause that mandates contractors to invest in Yemen's natural gas infrastructure.



Liquefied Natural Gas (LNG)

According to Cedigaz, Yemen exported a total of 243 Bcf of LNG in 2010, comprising 85 cargoes to markets in North America and Asia, principally South Korea and China. Due to a recent shift in relative demand growth from the Atlantic Basin to the Asia-Pacific region, Yemen LNG is seeking to divert as much as 560 million cubic feet per day (MMcf/d) to Asian markets through the negotiation of mid-term supply contracts.

The Yemen LNG project at the port of Balhaf on the Gulf of Aden became commercially operational in October 2009. At a cost of $4.5 billion, Yemen LNG is the largest industrial project in Yemen’s history. The Balhaf LNG processing plant, operated by Total, added a second train in April 2010, which increased total capacity to 326 Bcf/year. LNG exports increased significantly, as exports continued throughout the year. Production from the second 445 MMcf/d train came on-line in April 2010 and is expected to reach full capacity of a combined 890 MMcf/d in 2011. The Balhaf LNG terminal receives natural gas from Block 18 in the Marib-JawfBasin via a 200-mile, 900 thousand cubic feet per day (Mcf/d) capacity pipeline. Block 18 is operated by the state-run Safer E&P Operations Company, which has earmarked 10.2 Tcf of gas reserves for the LNG project.

Earnings from its LNG exports are projected to provide a partial offset of Yemen's falling oil export revenues in 2011. Nevertheless, due to the low price previously negotiated with Korea Gas for its LNG purchases, natural gas exports can only mitigate a downward trend in government revenues, even in the face of resurgent oil prices. Yemen also signed 20-year contracts with GDF Suez Company and lead developer, Total. Total holds a 39.6 percent stake in the project, followed by Hunt Oil, which holds 17.2 percent, Yemen Gas Company at 16.7 percent, and 3 South Korean companies - SK Gas at 9.55 percent, KoGas at 6 percent, Hyundai at 5.88 percent. Local Yemeni investors make up the balance.

Links

EIA Links

EIA – Yemen Country Energy Profile

U.S. Government
CIA World Factbook - Yemen
U.S. State Department Background Notes on Yemen

General Information
The World Bank
The Yemen Times

Government Agencies
Petroleum Exploration and Production Authority of Yemen (PEPA)
Yemen Ministry of Oil and Minerals
Yemen News Agency (SABA)

Oil and Natural Gas
Aden Refinery Company
Nexen Inc.
Safer Exploration and Production Operations Company (SEP
Total
Yemen LNG

Sources

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International Oil Daily
M iddle E ast E conomic Digest (MEED)
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Yemen Petroleum Exploration and Production Authority (PEPA)

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